Contact Information

Oil or Chemical Spill

call the National Response Center at

800-424-8802

Oil Spill Planning

in the Coastal Zone of California, contact the local U.S. Coast Guard Marine Safety Office (MSO):

MSO San Francisco Bay
510-437-3073

MSO Los Angeles/Long Beach
562-980-4444

MSO San Diego
619-683-6470

For RRT assistance in the Inland Zones of California, Arizona or Nevada, contact the Region IX office of the U.S. Environmental Protection Agency:
415-744-2332

Suggested References:

Using Oil Spill Dispersants on the Sea
National Research Council 1989

The Use of Chemicals in Oil Spill Response
American Society of Testing and Materials 1995

Region IX
Regional Response Team Website:

http://www.uscg.mil/pacarea/pm/rrt/rrtmin.htm

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Regions I & IX Mainland
Regional Response Teams

RRT-IX Co-chairs:
U.S. Coast Guard 510-437-2940
U.S. EPA 415-744-1730

DISPERSANTS IN OIL SPILL RESPONSE

Deploying dispersant by boat.

Photo: NOAA

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General Spill Response Considerations

When prevention efforts fail and an oil spill occurs on the water, spill responders face a difficult battle against a dynamic and ever-changing opponent. They have a number of tools at their disposal, depending on the unique aspects of each situation. Among the options available are mechanical cleanup methods, such as containment booms and skimmers, non-mechanical methods, such as dispersants or *in-situ* burning, natural removal, and shoreline cleanup. The selected mix of countermeasures will depend on potential shoreline and natural resource impacts, the size, location, and type of oil spilled, weather, and other variables.

What Are Dispersants?

Dispersants are specially designed oil spill products that are composed of detergent-like surfactants in low toxicity solvents. Dispersants do not actually remove oil from the water. Instead, they break the oil slick into small particles, which then disperse into the water where they are further broken down by natural processes. Dispersion of oil into the water column occurs naturally in untreated spills; dispersants just speed up the process. Dispersants also prevent the oil droplets from coming together again and forming another surface slick. Dispersants also reduce the ability of the oil to attach to birds and other animals, shoreline rocks, and vegetation. Fire and explosion hazards are lessened because dispersants reduce evaporation of volatile oil components. The effects of the rapidly diluted dispersed oil must be weighted against the effects of that oil if it were allowed to impact wildlife populations or the shoreline.

Dispersants may be applied to oil from airplanes, helicopters, or vessels. Dispersant spray systems are designed to provide the correct droplet size and dosage, as both are important factors in effective oil dispersal. The volume of dispersant applied is a fraction of the volume of oil treated, with a typical dispersant to oil ratio of 1:20.

Dispersants deployed by plane. Photo: USCG

Where the Oil Goes

When the oil is treated with dispersants, it initially disperses within approximately the upper 30 feet of the water column. The dispersed oil will be spread horizontally by tides and currents, rapidly decreasing the concentration of the oil. Many impacted water column populations will rapidly recover from the dispersed oil exposure because of their mobility. If these impacts are expected to be short term, these organisms are given a lower priority than bird and mammal populations and sensitive shoreline habitats, which when oiled recover quite slowly. Typically, dispersant use is reserved for deeper waters to ensure sufficient dilution of the oil and to prevent impacts on bottom-dwelling organisms. There may be cases where use in shallower environments can be justified to minimize impact to highly sensitive areas that are difficult to otherwise protect.

Dispersant Effectiveness

Like other spill response techniques, dispersants are not likely to be 100% effective in dispersing surface oil, but may be strategically employed to protect certain areas. Dispersant effectiveness is dependent on the type of oil and environmental conditions.

Approval of Dispersant Use

Because of the tradeoffs involved (i.e., relative benefits and potential negative effects), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) sets limitations on dispersant use. Dispersants must be on a national list maintained by the Environmental Protection Agency. Federal and state agency agreements establish areas where rapid decisions on dispersants may be made by the Federal On-Scene Coordinator. Use outside these areas requires the approval of additional agencies identified in the NCP.

Studies of Dispersants

The evidence from six spills treated with dispersants in United Kingdom waters since 1980 is that dispersion of oil (natural or chemical) into the water column can minimize overall environmental impacts by reducing damage to the shoreline and sea surface ecosystems. The limited environmental damage from the 1993 *Braer* incident, where large volumes of oil were dispersed naturally, provides particularly strong evidence that dispersion of oil can minimize the overall effects of a spill. Chemical dispersion in the *Sea Empress* spill in 1996 was found to reduce environmental damages and cleanup intrusiveness, cost, and duration.

What Are the Potential Benefits?

- Reduced surface oil on shore-lines, sensitive habitats, birds, mammals, and other wildlife.
- Rapid treatment of large areas.
- Reduced oil storage and disposal problems.
- Accelerated natural degradation processes.
- Use in high seas and currents is feasible.

What Are the Potential Tradeoffs?

- Increased oil impacts on organisms in the upper 30 feet of water column.
- Time frame for effective use may be short.